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College of Commerce and Business Administration
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Summary:

Since 1970 there have been three major changes in the commission fee structure for stock transactions in the United States. The last change in May, 1975 eliminated all formal fee schedules and dictated that the commission charges on all transactions would be completely negotiated. Many observers have speculated regarding the probable effect of this change to competitive commission on the several regional stock exchanges. This study sets forth the alternative hypotheses in this regard and examines the relative trading volume on the national and regional stock exchanges for the period 1970 through 1977. The results are best described as mixed, but tend to indicate that the regional stock exchanges as a group have survived this period of significant change.

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NEGOTIATED COMMISSIONS AND REGIONAL STOCK EXCHANGES*

Frank K. Reilly
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INTRODUCTION

The formal equity exchanges in the United States are typically broken down into two major divisions. The first group are the two national stock exchanges--the New York Stock Exchange (NYSE) and the American Stock Exchange (ASE). The second group are the regional stock exchanges located in several large cities outside New York (i.e., Boston, Chicago, Philadelphia, etc.).[1] The regional stock exchanges are an important part of our total capital allocation process because they provide an exchange market for the stock of many small firms that would not qualify for listing on one of the national exchanges. In addition, they provide added liquidity and an increase in competitive marketmaking for large firms that are dual listed on one or more of the regional exchanges in addition to being listed on one of the national exchanges. Because of dual listing it is possible for smaller regional investment firms to be primary brokers in these stocks.

The figures in Table 1 indicate that the status of the regional stock exchanges has varied over the years depending upon investor attitudes

*The authors acknowledge the use of the computer facilities at the University of Illinois and Northern Illinois University. During part of the period of this research Professor Reilly was an Associate at the Center for Advanced Studies at the University of Illinois.

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[1]It is recognized that all the exchanges are registered as national exchanges with the Securities and Exchange Commission. Our use of the term national and regional is in keeping with the prevailing terminology of most observors.

TABLE 1

TRADING VOLUME ON NEW YORK STOCK EXCHANGE,
AMERICAN STOCK EXCHANGE AND OTHER EXCHANGES AS A
PERCENT OF TRADING VOLUME ON ALL REGISTERED EXCHANGES
1955 - 1977
(Percent of Total Value; Percent of Total Shares)

	NYSE		ASE		NYSE + ASE		Other	
Year	% Val.	% Sh.	% Val.	% Sh.	% Val.	% Sh.	% Val.	% Sh.
1955	86.5	67.7	6.8	20.1	93.3	87.8	6.7	12.2
1956	85.1	64.5	7.7	22.3	92.8	86.8	7.2	13.2
1957	85.6	66.8	7.2	21.0	92.8	87.8	7.2	12.2
1958	85.6	70.5	7.3	19.6	92.9	90.1	7.1	9.8
1959	83.8	64.8	9.4	25.1	93.2	89.9	6.8	10.1
1960	83.9	69.0	9.2	21.6	93.1	90.6	6.8	9.3
1961	82.6	64.3	10.6	26.1	93.2	90.4	6.8	9.6
1962	86.5	71.3	6.7	20.0	93.2	91.3	6.8	8.7
1963	85.3	73.5	7.4	18.3	92.7	91.8	7.3	8.2
1964	83.7	72.5	8.2	19.4	91.9	91.9	8.0	8.1
1965	82.0	69.9	9.7	22.5	91.7	92.4	8.3	7.5
1966	80.1	69.2	11.5	22.9	91.6	92.1	8.4	7.9
1967	77.5	64.1	14.3	28.6	91.8	92.7	8.2	7.3
1968	73.8	62.1	17.7	29.6	91.5	91.7	8.5	8.3
1969	73.9	63.9	17.2	27.0	91.1	90.9	8.9	9.0
1970	78.7	70.8	10.9	19.4	89.6	90.2	10.4	9.8
1971	79.5	72.1	9.6	17.7	89.1	89.8	10.9	10.2
1972	78.3	71.4	10.0	17.5	88.3	89.9	11.7	11.1
1973	82.3	75.7	5.9	12.9	88.2	88.6	11.9	11.4
1974	83.9	79.0	4.3	9.8	88.2	88.8	11.9	11.2
1975	85.2	81.1	3.6	8.7	88.8	89.8	11.2	10.2
1976	84.4	80.3	3.8	9.0	88.2	89.3	11.8	10.7
1977	84.0	79.9	4.6	9.3	88.6	89.2	11.4	10.8

Source: Statistical Bulletin, United States Securities and Exchange Commission, Vols. 14-28 (1955-1978).

and the market environment. During the mid-1950's the regional stock exchanges prospered because investors were interested in small growth firms. There was a decline in activity during the 1960's with the trough apparently coming during 1967. Subsequently, there was a fairly steady increase in the relative trading on the regional exchanges through 1974 followed by a decline in 1975 and subsequent increases in 1976 and 1977. Most observers attribute this growth during 1967-1974 to the increase in trading by institutions on these exchanges because of the fixed commission structure. Specifically, with the fixed commission structure, the institutions were looking for ways to either recapture part of these excess charges or to use them to pay for other services.[2] If the growth in trading volume on the regional stock exchanges during this latter period was because of the fixed commission structure, a question of primary concern is the effect of fully negotiated commission rates on these exchanges. We consider this question by examining the trading volume for several of the regional stock exchanges relative to the New York Stock Exchange (NYSE) for the period since 1970 with special emphasis on the periods surrounding changes in the commission structure. Obviously the most critical period is the period following the infamous "May Day" (May 1, 1975), when commissions on all trades became subject to negotiation.

The initial section contains a more detailed discussion of the reasons for the existence of the regional exchanges and the functions they serve. The subsequent section discusses the effect of the growth

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[2]For a detailed discussion of those practices, see Chris Welles, "The War Between the Big Board and the Regionals," Institutional Investor, Vol. 4, No. 12 (December, 1970), pp. 21-27.

of financial institutions on the regional exchanges and the impact of the fixed commission structure. The following section contains a statement of the alternative hypotheses possible regarding the effects that negotiated commissions could have on the regional exchanges. The tests of the hypotheses are set forth and the results reported in the fourth section. The paper ends with a summary and a discussion of the implications of the results.

FUNCTIONS OF REGIONAL STOCK EXCHANGES

Regional security exchanges basically serve three functions:[3]

1. The listing of small regional companies that would not qualify for listing on one of the national securities exchanges--i.e., the NYSE or the ASE. Assuming some small firms would like the prestige and possibly the added liquidity for their stock that would come from listing on an exchange--they can list on one of the regional exchanges.
2. The dual listing of large companies that are already listed on a national exchange. Such dual listing is principally for the benefit of regional brokerage firms who cannot afford a membership on one of the national exchanges. Under such conditions, these members of the regional exchange encourage the dual listing

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[3]A more extended discussion on this topic is contained in James E. Walter, The Role of Regional Security Exchanges (Berkeley: University of California Press, 1957). There is also a brief history of the regional exchanges in, Securities and Exchange Commission, Special Study of the Securities Markets, House Document No. 95, 88th Congress, 2nd session, (Washington, D.C.: U.S. Government Printing Office, 1963), part 2.

of large popular stocks because the regional exchange member-broker can buy or sell the dual-listed stock for his customers and derive the full commission. If the stock is not listed on the regional stock exchange the broker acts through a correspondent who is a member of the national exchange and must share the commission. Obviously, the more dual listing the better it is for the regional member-broker.

3. The trading of unlisted stocks of interest to the members of the regional exchange. In cases where there is substantial interest in a stock that does not want to become listed on a regional exchange, the exchange can grant unlisted trading privileges in the stock to its members.

There has been a change in the proportion of total trading volume on the regional exchanges that is attributable to trading in regional companies and the percent attributable to trading dual listed stocks. As shown in Table 2, with the exception of the Los Angeles and San Francisco Exchanges, the proportion of trading in dual listed stocks grew steadily from 1944 to 1953. This trend has continued through 1976 to the point where trading in dual listed stocks is clearly the dominant business for these exchanges. Notably, the increase in this segment of the regional stock exchange business (trading in dual listed stocks and stocks granted unlisted trading privileges) came several years ago--before any increase in institutional trading. Apparently, the increase was due to the growth of regional brokerage firms that did not have NYSE memberships and the interest of the regional brokerage house customers in these large dual listed stocks.

TABLE 2

RELATIONSHIP OF SHARE VOLUME IN MULTIPLE
TRADED ISSUES TO TOTAL VOLUME
7 REGIONAL EXCHANGES
(in percent)

Exchange	1976[b]	1953[a]	1952[a]	1948[a]	1944[a]
Boston	94.4	85.0	83.5	82.8	64.2
Detroit	--[1]	69.6	69.2	56.6	38.7
Los Angeles	--[2]	37.1	41.6	38.8	43.2
Midwest	94.5	69.8	69.3	62.1	49.6
Phil.-Balt.	82.4[3]	91.7	91.6	89.2	83.5
Pittsburgh	--[4]	54.3	46.5	49.8	43.0
San Francisco	92.0[2]	27.4	25.5	36.9	39.5
Total	91.0[5]	54.4	54.0	53.7	50.3

[1]Detroit Stock Exchange closed its doors on June 30, 1976.

[2]San Francisco and Los Angeles merged effective 12-31-56 as the Pacific Coast Stock Exchange. It has since changed its name to The Pacific Stock Exchange, Inc.

[3]Philadelphia-Baltimore (later P-B-W) changed its name to the Philadelphia Stock Exchange, Inc., on May 10, 1976. The proportion of dually traded securities is understated as it considers only stocks granted dual trading privileges. Thus it excludes the trading activity in dually-listed stocks.

[4]Pittsburgh merged with P-B-W effective 12-31-69.

[5]The total represents a weighted average of all dually traded stocks with respect to total volume trades of cited exchange.

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[a]Source: James E. Walter, The Role of Regional Exchanges (Los Angeles: University of California Press, 1957), p. 24.

[b]Source: The 1976 figures were obtained as follows. The total volume per exchange was taken from the Statistical Bulletin, United States Securities and Exchange Commission, Vol. XXXVI (1977). The annual volume of trading in dually listed securities and stocks granted dual trading privileges was obtained from the individual exchanges.

Besides the benefits of dual listing to regional brokerage firms, several studies that have examined the factors that influence the cost of liquidity services have found that there is a significant negative relationship between the cost of liquidity as represented by the bid-ask spread and the number of competing markets (i.e., the more markets the smaller the bid-ask spread). Specifically, the initial study in this area by Demsetz[4] considered the number of markets on which a stock was traded and derived a negative coefficient for the market variable but it was not statistically significant. A subsequent study by Tinic[5] likewise included a variable that measured the competition in market-making. Rather than simply the number of other markets where the stock was traded Tinic computed the Herfindahl Index of Concentration that indicates the proportion of trading on the NYSE. In this case, if competition improves the market one would expect a positive relationship--i.e., the lower the concentration of trading on the NYSE, the smaller the spread. The significant positive coefficient results confirmed the benefits of competition.

A study by Tinic and West[6] examined the cost of dealer services on the OTC market and also considered the effect of competing marketmakers

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[4] Harold Demsetz, "The Cost of Transacting," Quarterly Journal of Economics, Vol. 82, No. 1 (February, 1968), pp. 33-53.

[5] Seha M. Tinic, "The Economics of Liquidity Services," Quarterly Journal of Economics, Vol. 86, No. 1 (February, 1972), pp. 79-93.

[6] Seha M. Tinic and Richard R. West, "Competition and the Pricing of Dealer Service in the Over-the-Counter Stock Market," Journal of Financial and Quantitative Analysis, Vol. 7, No. 3 (June, 1972), pp. 1707-1726.

by examining the relationship between the bid-ask spread and the number of dealers making a market in the stock. The significant negative coefficient supported the benefits of competition. A subsequent study by Benston and Hagerman[7] likewise examined the determinants of the spread for OTC stocks and considered the effect of the number of dealers. The coefficient for the number of dealers was negative and significant indicating that increased competition reduces the spread.

Branch and Freed[8] considered five variables to explain the percent spread for a sample of stocks on the NYSE and the American Stock Exchange (ASE). One of the variables included was the number of exchanges where the security is traded as a measure of the amount of competition. For the stocks on the NYSE, the coefficient for the number of exchanges was significant and negative. Finally, a study by Hamilton[9] examined the relationship between the dealer spread and the number of exchanges for a sample of NYSE stocks and a comparable sample of OTC stocks. Again, the results indicated a negative relationship between the spread and the number of markets.

In summary, the several studies on the determinants of marketmakers bid-ask spread have consistently indicated a strong <u>negative</u> relationship

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[7] George J. Benston and Robert L. Hagerman, "Determinants of Bid-Ask Spreads in the Over-the-Counter Market," <u>Journal of Financial Economics</u>, Vol. 1, No. 4 (December, 1974), pp. 353-364.

[8] Ben Branch and Walter Freed, "Bid-Ask Spreads on the AMEX and the Big Board," <u>Journal of Finance</u>, Vol. 32, No. 1 (March, 1977), pp. 159-163.

[9] James L. Hamilton, "Competition, Scale Economics, and Transaction Cost in the Stock Market," <u>Journal of Financial and Quantitative Analysis</u>, Vol. 11, No. 5 (December, 1976), pp. 779-802.

between the spread and the number of competing marketmakers as measured by the number of exchange markets for listed stocks or the number of dealers for OTC stocks. This clearly implies that the regional exchanges provide a real economic benefit to the capital markets in terms of greater liquidity and superior markets for those stocks on the national exchanges that are dual listed on one or more of the regional stock exchanges. Put another way, the bulk of trading on the regional stock exchanges is in dual listed stocks and this overriding function is a real benefit to the firms and investors involved in these stocks.

INSTITUTIONS AND THE REGIONAL STOCK EXCHANGES

Pre-1969 Effect

Trading by institutions began to increase dramatically starting in about 1965, with large increases during 1967 and 1968. During this period of significant growth there were fixed commission charges that did not consider the economies of scale in trading large blocks. Because of this pricing system that was inconsistent with the economies of trading, the well-known "give up" system developed whereby institutions instructed their brokers to split their brokerage fee with other firms that were providing research and sales efforts for the financial institution. As noted in an article by Hoddeson, this fee-splitting was much easier on most of the regional exchanges than it was on the NYSE or the ASE.[10] Specifically, while the NYSE would only allow fee splitting with other members of the Exchange, most of the regional exchanges would allow

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[10] David A. Hoddeson, "Rise and Fall? Prospering Regional Exchanges May Face Tough New Rules," Barron's (February 6, 1967).

"give-ups" to any member of the National Association of Securities Dealers (NASD). This leniency in give-up distribution contributed to substantial growth for all the regional exchanges and was a major reason for the increase in the proportion of trading on regional stock exchanges to be centered in dual-listed stocks. According to Hoddeson, at one point during this period about 98 percent of total volume on the regional stock exchanges was in dual listed stocks.

In addition, some of the regional exchanges benefitted from allowing institutions to become members of the exchanges. This practice which was initiated on the Pacific Stock Exchange allowed the institutions to make further savings on trades in stocks listed on this exchange. By 1970, 60 institutionally affiliated firms had become members of one of the regional exchanges.[11] Apparently the Midwest Stock Exchange had the smallest institutional membership because it allowed only 50 percent of the business to come from the institutional parent.

Finally, the regional exchanges benefitted from the growth in institutional trading because they offered economies in terms of lower taxes than charged by New York City.[12] The regional exchanges also allowed lower commissions on direct crosses and they were more liberal regarding the use of the third market when trading blocks.[13]

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[11] Chris Welles, "The War Between...," Op. Cit.

[12] "Taxes Make Trading on the NYSE Costly," Business Week (December 8, 1975), p. 60.

[13] Chris Welles, "The War Between...," Op. Cit.

There was some concern in 1967 because the SEC issued an order that formally banned the use of cash give-ups and also proposed a discount in the commission on large block trades. The NYSE supported both changes because they would apparently be detrimental to the regional exchanges.

Post-1969 Effect

The ban against cash give-ups was implemented, but as pointed out by Welles, it had little effect on the regionals who introduced ingenious fee-splitting techniques.[14] Specifically, the regional exchanges developed four-way tickets that allowed brokers to pay other member brokers part of their fee for providing execution or clearing assistance. The point is, it appears that the regional exchanges were not seriously affected by these changes because during this period there were still excess commissions available and the regional exchanges devised ways to circumvent the ban on cash give-ups. The success of these devices and institutional membership can be seen in the figures in Table 1 that show that the percent of trading on the regional exchanges grew steadily from 1962 through 1973.

In addition, there was an increase in volume because of the block business done on the regional exchanges. Specifically, there were two reasons for institutions and institutional brokers to cross a block on a regional stock exchange rather than on the NYSE. First, the lower transfer tax outside of New York which could make a difference on a large trade. Second, in many instances it is contended that the block

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[14] *Ibid.*

trade will go smoother on a regional exchange because the specialist on a regional stock exchange will not be as likely to take part of the block to clean up some limit orders or correct his personal inventory position as sometimes happens on the NYSE. Therefore, it is speculated that block business has been maintained on the regional exchanges.

NEGOTIATED RATES AND REGIONAL STOCK EXCHANGES

Three Rate Changes

There were three major changes in the fixed commission rate structure as follows:

1. April 5, 1971: The commission on that part of an order exceeding $500,000 could be negotiated between the broker and the customer.
2. April 24, 1972: The commission on that part of an order exceeding $300,000 became subject to negotiation.
3. May 1, 1975: The commission on all trades became subject to negotiation.[15]

Given the three changes, one can envision two alternative hypotheses regarding the effect of the commission changes on the regional stock exchanges.

Adverse Hypothesis

The prior discussion indicated that the regional stock exchanges enjoyed a period of strong relative growth because they allowed fee-splitting during a time when fixed commissions on large trades by

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[15] New York Stock Exchange, Fact Book, 1976, p. 59.

financial institutions was clearly excessive. The excess commissions also encouraged institutions to become members of regional exchanges and this also brought volume to these exchanges. Even after cash give-ups were banned, the regionals devised other methods to keep the practice alive. Finally, the regional exchanges benefitted from lower taxes and transfer costs because of electronic bookkeeping advances.

Obviously, if one believes that the major reason for the growth of regional stock exchanges was the excess commissions, they would expect that the changes to negotiated commissions would be detrimental to the future growth and prosperity of the regional stock exchanges. With fully negotiated commissions one should expect commissions to eventually decline to a rate that is consistent with the costs of the transaction. Under such conditions, there is no need to worry about fee-splitting because there are no excess fees to split. In addition, one might expect a decline in the number of institutional members on the regional exchanges because the institutions only joined to recapture some of the excess commissions. Once there are no excess payments it is unnecessary to have a membership because it is possible to get a good transaction at a competitive price without the membership. With competitive rates, the regional stock exchanges would lose their advantages and would be forced to compete against the NYSE on the basis of pure market-making. Some observors have contended that under such conditions the regional exchanges would be at a serious disadvantage because of substantial economies of scale in trading. Based upon this line of reasoning Doede concluded:

> The solution to this situation is clear; remove the right of the NYSE to fix prices and allow the members of the exchange to compete with one another for

> securities transactions. This would have two effects: one, the other exchanges would probably be forced out of business since they would not be able to operate profitably in a competitive market, and . . . .[16]

In a subsequent book West and Tinic refer extensively to Doede's study and conclude:

> Thus far the thrust of our argument has been that the primary threat to the major exchanges comes from the over-the-counter market. We might then ask where this leaves the regional exchanges? The answer would appear to depend on the NYSE's policy in regard to commissions. If it were to move the commission structure to the competitive level, it would almost certainly "monopolize" the trading that does not take place in the over-the-counter market. This would include the trading done by rank-and-file investors as well as the transactions made by the over-the-counter firms in the process of evening out their positions. On the other hand, if the Exchange were to attempt to maintain a price somewhat higher than the competitive level, it would provide an umbrella under which the regional exchanges could, perhaps, survive. In either event, however, the future of the regional exchanges, like that of the major exchanges, seems destined to be somewhat less than rosy. (emphasis added)[17]

In November, 1974 a symposium was held in Los Angeles on the topic of regional stock exchanges in a central market system.[18]

> The sympmosium's purpose was to review the status at a particular time of legislative and regulatory efforts to facilitate the creation of such a national, central market system, and to focus on the likely impact of these efforts on both the near-term and longer-term viability of regional market centers and especially regional stock exchanges.[19]

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[16] Robert W. Doede, "The Monopoly Power of the New York Stock Exchange," unpublished Ph.D. dissertation, University of Chicago, 1967.

[17] Richard R. West and Seha M. Tinic, The Economics of the Stock Market (New York: Praeger Publishers, 1971), p. 221.

[18] Donald E. Farrar, ed., "Regional Stock Exchanges in a Central Market System," Explorations in Economic Research, Vol. 2, No. 3 (Summer, 1975).

[19] Ibid., p. vi.

The participants included a cross section of individuals for financial institutions, the government, the regional stock exchanges, and academic institutions. Notably, most of the strong opinions that were expressed (most participants did not provide a strong opinion regarding the potential outcomes) were consistent with the adverse hypothesis. Specifically, Seymour Smidt stated:

> Under current circumstances, I would expect the elimination of fixed commissions on brokerage services to substantially reduce the volume of trading done on regional stock exchanges and the third market.[20]

Even the presidents of three of the regional stock exchanges were generally pessimistic regarding the outlook for their exchanges as a result of negotiated commissions without a central market (i.e., they generally felt they would be able to compete when the attributes of a central market was implemented). Specifically, Elkins Wetherill, president of the Philadelphia Stock Exchange stated:

> Another detriment to the continuation of the regionals during this near-term period will be the lack of reciprocal business. With fully negotiated rates reciprocal business probably will dry up; this has always been a great source of volume for the regional exchanges.[21]

Likewise G. Robert Ackerman, president of the Pacific Stock Exchange discussed some positive benefits from the central market, but regarding negotiated commissions, stated:

> The fourth element of the central market system is negotiated rates. This is the one area that we see as detrimental to regional exchanges, including the Pacific. It is detrimental because we expect a loss

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[20] Ibid., p. vi.

[21] Ibid., p. 392.

> of business due to the reciprocal aspects that Elkins Wetherill touched on a few minutes ago, and we see a reduction in the number of firms doing brokerage business.[22]

Finally, James E. Dowd, president of the Boston Stock Exchange, stated:

> As both Elkins and Bob indicated, we feel that fully unfixed rates will have a negative impact on incentives for regional exchange membership.[23]

In summary, a number of very knowledgeable observors felt that the imposition of fully negotiated commissions would have an adverse impact on the relative trading volume for the regional stock exchanges compared to the volume for the two national exchanges, especially the NYSE.

<u>No Effect Hypothesis</u>

One might contend that the regional exchanges have grown and prospered because of the market-making of their specialists and because of their innovative electronic record-keeping and transfer arrangements. Also, Hoddeson pointed out that the regional exchanges were more liberal regarding the use of the third market for block trades. Finally, it is contended that it is often easier and cheaper to cross block trades on a regional stock exchange. If these conditions are present and dominant, then the change in the commission structure should have little effect on the regional exchanges. In addition, one might speculate that the growth of the regional exchanges was due to activity in dual listed stocks from regional brokers who had no choice but to go to the regional

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[22] <u>Ibid.</u>, p. 397.

[23] <u>Ibid.</u>, pp. 397-98.

stock exchange. For regional brokers it is inconsequential whether rates become negotiated--they will continue to take orders from their customers in dual listed stocks to the regional stock exchanges whenever possible.

Therefore, if one believes that the growth of the regional stock exchanges is due to innovation, flexibility, good block trading practices, and the growth of regional broker members, they would expect the change in commission structure to have no major effect on the regional stock exchanges.[24]

Another factor that could affect the results that is not connected to negotiated commissions was the complete implementation of the consolidated tape for all NYSE stocks in June, 1975 and for all ASE stocks in early 1976. With the consolidated tape all transactions for stocks listed on the NYSE or the ASE are reported on the tape irrespective of where they are traded. Therefore, a trade in General Motors on the Midwest Stock Exchange would be reported the same as a comparable trade on the NYSE. During the initial period the trades indicated on the exchange where the transaction took place. Notably, almost all observors felt that this change would be beneficial to the regional stock exchanges because it would increase the awareness of the exchanges by market observors.

Tests of Hypotheses

The tests entail an analysis of the trends in relative trading for relevant time periods. Specifically, since the three major changes in

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[24] For a discussion of some of these factors and a brief analysis of the regional exchanges, see "The Regional Stock Exchanges Fight for Survival," Fortune (November, 1973).

commission rates have taken place since 1971 there is an analysis of changes in the relative trading over time for each of the exchanges (national and regional) since 1970. The data examined is monthly trading data for the period January, 1970 through December, 1977 (96 monthly observations). The analysis considers relative trading for each of the exchanges defined as the dollar value of trading on a specified exchange as a percent of the dollar value of trading on all registered exchanges. Figures are also reported for relative trading in shares, but these results are typically not discussed because most of the results would not change and such a discussion would add considerably to the length of the study.

The time series of relative trading for the following stock exchanges are examined:

1. American Stock Exchange (ASE)
2. Boston Stock Exchange (BSE)
3. Cincinnati Stock Exchange (CSE)
4. Detroit Stock Exchange (DSE)
5. Midwest Stock Exchange (MWSE)
6. New York Stock Exchange (NYSE)
7. Pacific Stock Exchange (PSE)
8. Philadelphia Stock Exchange (PHSE)
9. BSE-MWSE-PSE-PHSE (Combined)

The last combination is considered the major regional exchanges.

ANALYSIS OF RESULTS

For each of the nine series there is an analysis of the trend in relative trading using the following model.

$$RT_{it} = a_i + b_i \text{ Time} + \varepsilon_i$$

RT_{it} - relative trading on exchange i during period t

a_i - constant term for exchange i

b_i - slope coefficient for exchange i

Time - the monthly time variable for the period of analysis

ε_i - the random error term for exchange i

The analysis centers on the value and significance of the b_i coefficient. The adverse hypothesis would expect that this slope coefficient would be negative and significant for the various regional stock exchanges after the changes in commission structure, while this coefficient would be positive and significant for the two national exchanges, especially the NYSE. In contrast, the no effect hypothesis would expect this slope coefficient to be insignificantly different from zero (i.e., no slope) for all the exchanges. Obviously, a positive slope for any of the regional exchanges would likewise support the no effect hypothesis because it would indicate that the regional stock exchanges had <u>gained</u> in relative trading activity during this period.

April, 1971 to December, 1977

The results for the period following the first change until December, 1977 are contained in Table 3.[25] Overall these results are mixed. There is some support for the adverse hypothesis since two of the regional exchanges had significant negative slopes (DSE and PHSE) and the NYSE had a very significant positive slope during this period. At the same time, the no effect hypothesis receives support because the slope for the PSE was negative but not significant and the slopes for the BSE, CSE, and MSE were all positive and significant. Likewise the slope for the combined regional exchanges was negative but insignificant. Also, the slope coefficient for the second national exchange (the ASE) was significant and negative.

May, 1972 to December, 1977

The regression results for this time period are contained in Table 4. Again the results are mixed but tend to provide support for the adverse hypothesis. Specifically, three of the regional exchanges (BSE, DSE, and PHSE) had significant negative slopes and the combined regional exchange regression had a significant negative slope. Also, the NYSE regression had a large significantly positive slope. The only evidence in support of the no effect hypothesis is a significant positive slope for the CSE, a positive but insignificant slope for the MSE, and a negative but insignificant slope for the PSE. Also, the ASE slope is significantly negative.

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[25] This trend regression was run for the total period January, 1970 to December, 1977 and the results are almost identical to those reported in Table 3.

TABLE 3

REGRESSION RESULTS FOR STOCK TRADING
REGRESSED AGAINST TIME
TIME PERIOD: APRIL 1971 THRU DECEMBER 1977

	Dollar Value				Shares Traded			
	Constant	Slope Coeff	T-Val Sl Coeff	R^2	Constant	Slope Coeff	T-Val Sl Coeff	R^2
ASE	26.469	-0.088	-11.42	0.623	44.051	-0.137	-14.33	0.722
BSE	0.398	0.002	1.92	0.004	0.024	0.003	3.83	0.156
CSE	-2.109	0.010	13.69	0.704	-1.876	0.009	13.41	0.695
DSE	0.897	-0.003	-11.44	0.624	0.775	-0.003	-11.35	0.620
MSE	2.225	0.010	3.75	0.151	3.369	0.003	1.01	0.013
NYSE	62.130	0.087	10.94	0.602	44.101	0.141	13.94	0.711
PSE	4.225	-0.003	-1.52	0.028	3.414	0.001	0.55	0.004
PHSE	5.584	-0.015	-9.79	0.548	4.706	-0.012	-8.02	0.449
Comb	12.542	-0.006	-1.49	0.027	11.524	-0.006	-1.37	0.023

TABLE 4

REGRESSION RESULTS FOR STOCK TRADING
REGRESSED AGAINST TIME
TIME PERIOD: MAY 1972 THRU DECEMBER 1977

	Dollar Value				Shares Traded			
	Constant	Slope Coeff	T-Val Sl Coeff	R^2	Constant	Slope Coeff	T-Val Sl Coeff	R^2
ASE	19.571	-0.060	-7.21	0.441	36.222	-0.106	-9.93	0.599
BSE	1.652	-0.003	-1.91	0.052	0.765	0.000	0.08	0.001
CSE	-2.805	0.013	14.37	0.758	-2.497	0.011	14.03	0.748
DSE	1.123	-0.004	-12.17	0.692	0.982	-0.004	-12.61	0.700
MSE	3.237	0.006	1.62	0.038	4.610	-0.002	-0.67	0.004
NYSE	66.017	0.072	7.37	0.452	48.312	0.124	9.66	0.585
PSE	4.427	-0.003	-1.50	0.033	4.034	-0.001	-0.60	0.001
PHSE	6.599	-0.019	-11.04	0.649	5.906	-0.017	-9.68	0.582
Comb	15.920	-0.019	-4.15	0.207	15.323	-0.021	-4.46	0.237

In summary, the results are again mixed but on balance tend to provide support for the adverse effect hypothesis because the combined exchange slope coefficient is significantly negative and the NYSE slope is significantly positive.

May, 1975 to December, 1977

The results for the two-and-a-half year period following "May Day" are contained in Table 5. While the results are again mixed, the bulk of the evidence supports the no effect hypothesis. Only two of the regional exchanges had significant negative coefficients (BSE and DSE). All the other regional exchanges had significant positive coefficients (CSE) or insignificant coefficients (MSE, PSE, and PHSE), and the coefficient for the combined regional stock exchanges was insignificant. In addition, the slope coefficient for the NYSE was negative and significant, although the ASE was positive and significant. The shares traded results were consistent except that the ASE and NYSE slope coefficients were both insignificant.

In summary, the results were mixed but on balance supported the no effect hypothesis because of the preponderance of positive or insignificant coefficients for the regional stock exchanges and the significant negative coefficient for the NYSE.

Mean Percents Over Time

In addition to the analysis of the trends, Table 6 contains data on the means and standard deviation of percent trading for alternative nonoverlapping periods during 1970-1977. The four subperiods coincide with the period prior to commission changes, the periods following each of the

TABLE 5

REGRESSION RESULTS FOR STOCK TRADING
REGRESSED AGAINST TIME
TIME PERIOD: MAY 1975 THRU DECEMBER 1977

	Dollar Value				Shares Traded			
	Constant	Slope Coeff	T-Val Sl Coeff	R^2	Constant	Slope Coeff	T-Val Sl Coeff	R^2
ASE	-4.759	0.034	3.10	0.242	5.716	0.012	0.62	0.013
BSE	5.557	-0.018	-7.69	0.663	3.424	-0.010	-3.90	0.336
CSE	-5.514	0.023	9.45	0.748	-5.010	0.021	9.29	0.742
DSE	1.076	-0.004	-9.75	0.760	1.002	-0.004	-9.71	0.759
MSE	2.150	0.010	0.69	0.016	2.200	0.007	0.53	0.009
NYSE	95.712	-0.043	-2.07	0.125	89.620	-0.035	-1.29	0.053
PSE	3.497	0.000	0.05	0.001	2.087	0.006	0.90	0.026
PHSE	2.297	-0.002	-0.50	0.008	1.615	-0.001	-0.12	0.001
Comb	13.516	-0.010	-0.64	0.013	9.298	0.002	0.16	0.001

TABLE 6

MEAN AND STANDARD DEVIATION OF PERCENT TRADING
(DOLLAR VALUE) DURING ALTERNATIVE TIME PERIODS:
JANUARY, 1970-DECEMBER, 1977

	1/70-3/71 (15 months)		4/71-4/72 (13 months)		5/72-4/75 (35 months)		5/75-12/77 (32 months)	
	Mean $ Value	Std. Dev.	Mean $ Value	Std. Dev.	Mean $ Value	Std. Dev.	Mean $ Value	Std. Dev.
ASE	10.51	2.08	10.21	1.08	5.71	0.96	4.01	0.57
BSE	0.67	0.12	0.62	0.12	1.08	0.12	0.92	0.12
CSE	0.04	0.02	0.04	0.02	0.07	0.02	0.53	0.13
DSE	0.12	0.02	0.20	0.05	0.21	0.04	0.03	0.02
MSE	3.51	0.85	4.00	0.26	4.56	0.40	4.72	0.74
NYSE	79.12	2.07	78.80	0.75	82.41	0.90	84.53	1.08
PSE	3.93	0.44	3.68	0.24	3.62	0.30	3.60	0.38
PHSE	2.12	0.34	2.39	0.38	2.31	0.24	1.66	0.26
Comb.	10.22	1.24	10.74	0.56	11.58	0.69	10.89	0.83

first two changes, and finally the period after "May Day." The results are best discussed in terms of individual exchanges.

The mean percents for the ASE indicate a steady significant decline from over 10 percent to about 4 percent. The BSE experienced a peak prior to May Day followed by an insignificant decline. Overall the BSE results indicated an increase for the period prior to commission changes to the period after May Day although there was a decline since May Day. The CSE began from an extremely small base, but has clearly experienced a significant increase in the percent of trading during the total period. In contrast, the DSE appeared to be doing well prior to May Day, but then the percent began to steadily decline from May, 1975 to March, 1976 and averaged only 0.09 percent during this period. Finally, in May, 1976 the DSE announced it would close as of June 30.[26] It is stated in the WSJ article:

> The Detroit exchange experienced its busiest period during the late 1960's when large institutions took advantage of a commission structure on the regional exchanges that was looser than that at the New York Stock Exchange. But when competitive rates were established on the New York Stock Exchange, the regional exchanges lost a key advantage.[27]

Therefore, the effect was clearly severe on the DSE. Another contrast to this dismal effect was provided by the MSE that experienced a small but steady increase in the percent of trading during the four subperiods going from about 3.5 percent to 4.7 percent. Even while the BSE, CSE,

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[26] "Detroit Exchange Says It Will Close June 30, Cites Lagging Volume," Wall Street Journal (May 17, 1976).

[27] Op. Cit.

and MSE were gaining so was the NYSE. As shown, there was a slight decline on the NYSE during the 1971-72 period, but clear increases during the latter periods such that the percent of trading on the NYSE during the time after May Day exceeded all prior periods and the NYSE ended the period with a dominant 85 percent of all trading. These results for the NYSE alone would tend to support the adverse effect hypothesis because they indicate strong growth for this national exchange. The results for the PSE indicate a steady but insignificant decline in the percent of trading which is consistent with the insignificant trend variable. The PHSE experienced a small increase in the proportion of trading after the initial commission changes, but has experienced a definite decline following May Day.

Therefore, the results for the six regional exchanges are again best described as mixed since three regional exchanges experienced very consistent increases (BSE, CSE, and MSE), two exchanges experienced insignificant declines (PSE and PHSE), and one exchange (DSE) went out of business. Overall, the results for the combined regional exchanges provide support for the no effect hypothesis because the mean percent of trading since May Day exceeded the percent during the two earliest periods but was below the mean just prior to May Day.

These apparently contradictory results which show the NYSE experiencing an overall gain <u>and</u> the composite of regional exchanges likewise experiencing an overall gain are explained by the significant decline experienced by the ASE during this total time period. Apparently both sets of exchanges experienced gains at the expense of the ASE, with the NYSE deriving most of the increase.

SUMMARY AND CONCLUSION

Summary

It is generally acknowledged that the regional stock exchanges are an important part of our total equity market structure because of the liquidity they provide for small firms not eligible for listing on one of the national exchanges and also the added liquidity and competition for large firms that are dual listed. With the imposition of fully competitive commissions, an important question concerns the effect of this change on these regional stock exchanges. It is possible to propose two contrasting hypotheses. The adverse effect hypothesis contends that the regional exchanges experienced growth since 1965 because they provided a convenient vehicle to distribute the excess commissions paid by institutions during the era of fixed commissions. Therefore, when commissions became competitive some observors expected a significant shift in trading activity to the NYSE because of the perceived economies of scale in marketmaking. In contrast, those who advocate a no effect hypothesis contended that the regional exchanges had developed strong marketmaking capabilities, provided efficient, low-cost trading facilities, and were preferred by many block traders. Therefore, these observors would not expect a major change in the proportion of trading done on the regional stock exchanges after the commission changes.

The tests involved a detailed analysis of the proportion of dollar and shares traded during the subperiods surrounding the changes in the commission structure. There were two sets of tests. The first set examined the trend of activity for alternative subperiods. The second

set of tests examined the mean percent of trading for the alternative regional exchanges compared to the trading on the two national exchanges.

The results are best described as mixed in terms of the effect on individual regional stock exchanges, and also mixed regarding the overall hypotheses. Specifically, three regional exchanges experienced an increase in relative trading activity, two regional exchanges held about even with some signs of weakness, while one regional stock exchange went out of business. Overall, the combined results for the four major regional exchanges support the no effect hypothesis because the percent of trading after May Day was above the percent prior to any changes in commission. At the same time, the results for the NYSE support the adverse effect hypothesis because the proportion of trading on the NYSE also increased as shown by most trend coefficients and the mean trading values.

These contrasting results are explained by the losses in relative trading experienced by the ASE during this period. Notably, the NYSE seemed to gain most of what was lost by the ASE.

Conclusion

Although the results have been consistently mixed, the authors feel that on balance the results support the no effect hypothesis as related to the regional stock exchanges because the overall trend for the combined group is insignificantly different from zero and the overall percent of trading on the regional stock exchanges was slightly higher after May Day than at the beginning of the period. This conclusion must be tempered because the NYSE results likewise indicate gains during the overall period, but a small decline since May Day.

Given the numerous, well-informed observors who generally expected the imposition of negotiated commissions to adversely impact on the regional stock exchanges, these results are somewhat surprising. This is especially true since negotiated commissions were quite detrimental to the third market. An earlier study by one of the authors indicated that the third market suffered a severe decline following the commission changes and currently is best described as defunct.[28] One might contend that the regional stock exchanges have unique marketmaking capabilities separate from the NYSE and this capability was highlighted by the introduction of the consolidated tape in June, 1975. A study by Garbade and Silber examined the price effects on some dual traded stocks after the consolidated tape was introduced and concluded that the time-price relationships indicated that the timely reports of regional exchange transactions began to affect the pricing of New York trades.[29] Therefore, one might speculate that the benefits of the consolidated tape offset the adverse effects of fully negotiated commissions. The point is, it appears that the regional stock exchanges have survived this major market change in the short-run. Whether they will be able to survive and prosper in the long-run and continue to provide added liquidity and competition remains to be seen.

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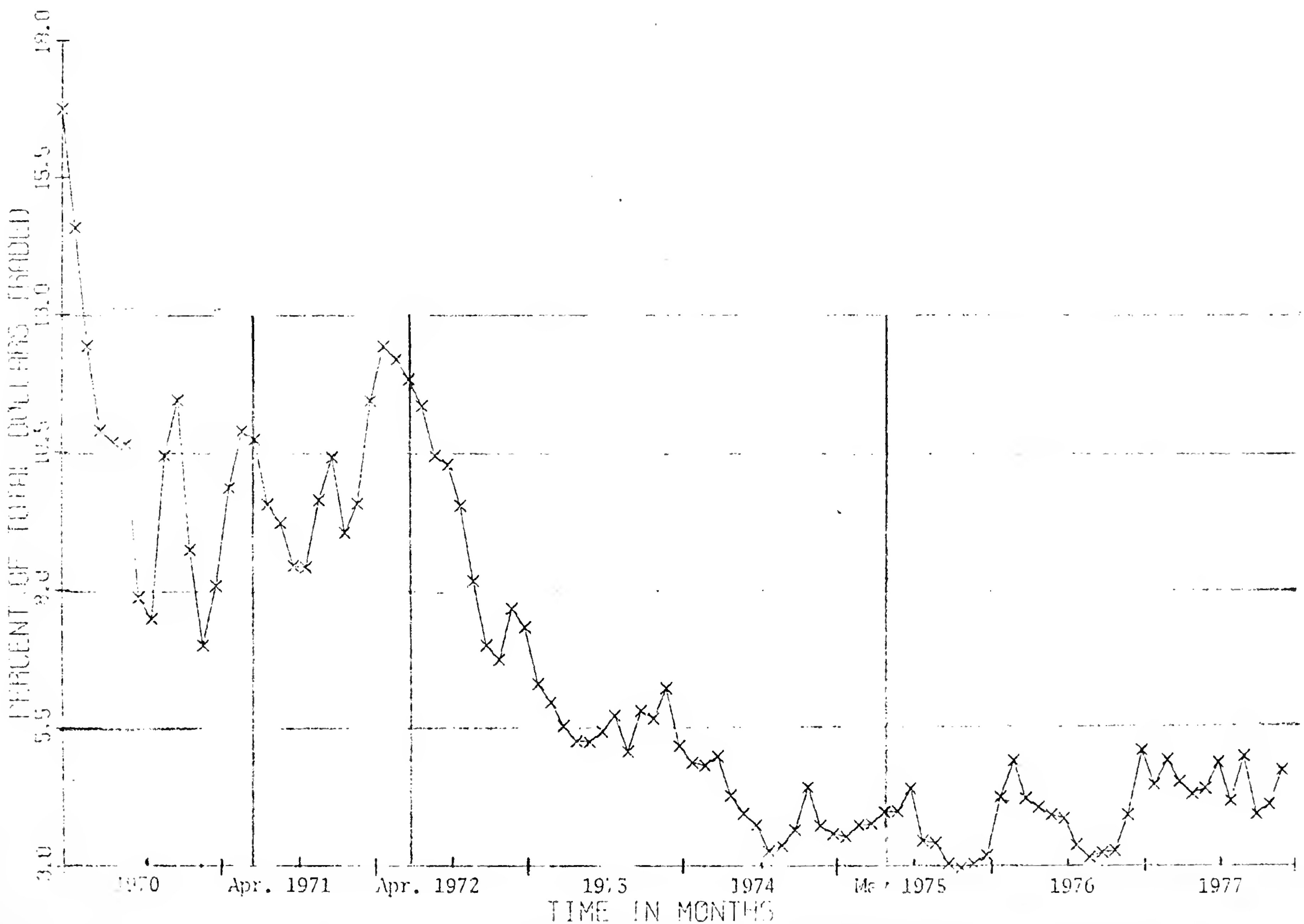
[28] Frank K. Reilly, "Negotiated Commissions and the Third Market," University of Illinois, Working Paper No. 429 (August, 1977).

[29] Kenneth D. Garbade and William L. Silber, "Dually Traded Securities: A Study of Dominant and Satellite Markets," Salomon Brothers Center for the Study of Financial Institutions, Working Paper No. 112 (March, 1977).

MONTHLY TIME SERIES PLOT OF DOLLAR VALUE OF TRADING ON AMERICAN STOCK EXCHANGE
AS A PERCENTAGE OF TOTAL DOLLAR VALUE OF TRADING ON ALL REGISTERED EXCHANGES
January, 1970 - December, 1977



MONTHLY TIME SERIES PLOT OF NUMBER OF SHARES OF TRADING ON DETROIT STOCK EXCHANGE
AS A PERCENTAGE OF TOTAL NUMBER OF SHARES OF TRADING ON ALL REGISTERED EXCHANGES
January, 1970 - December, 1977

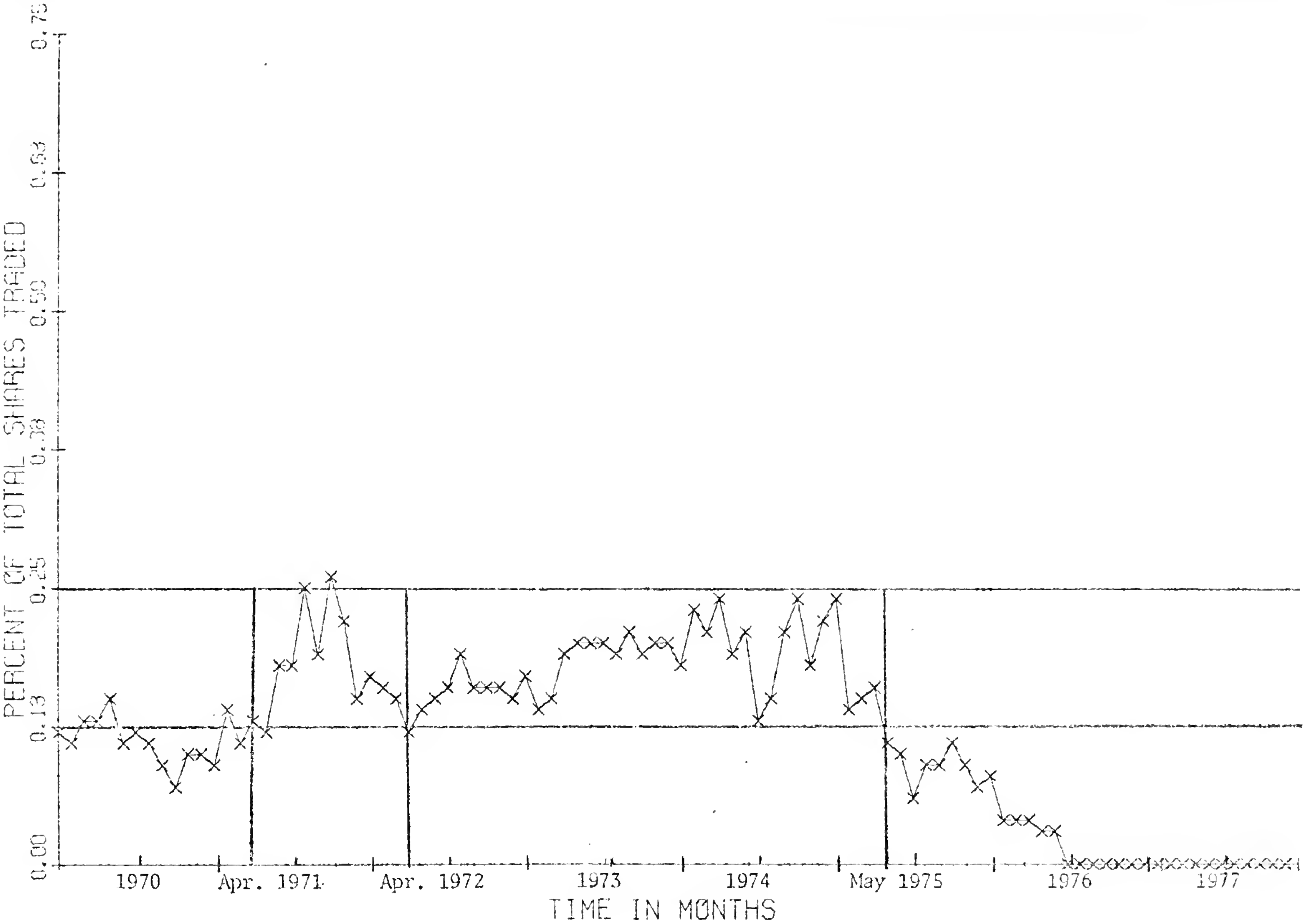
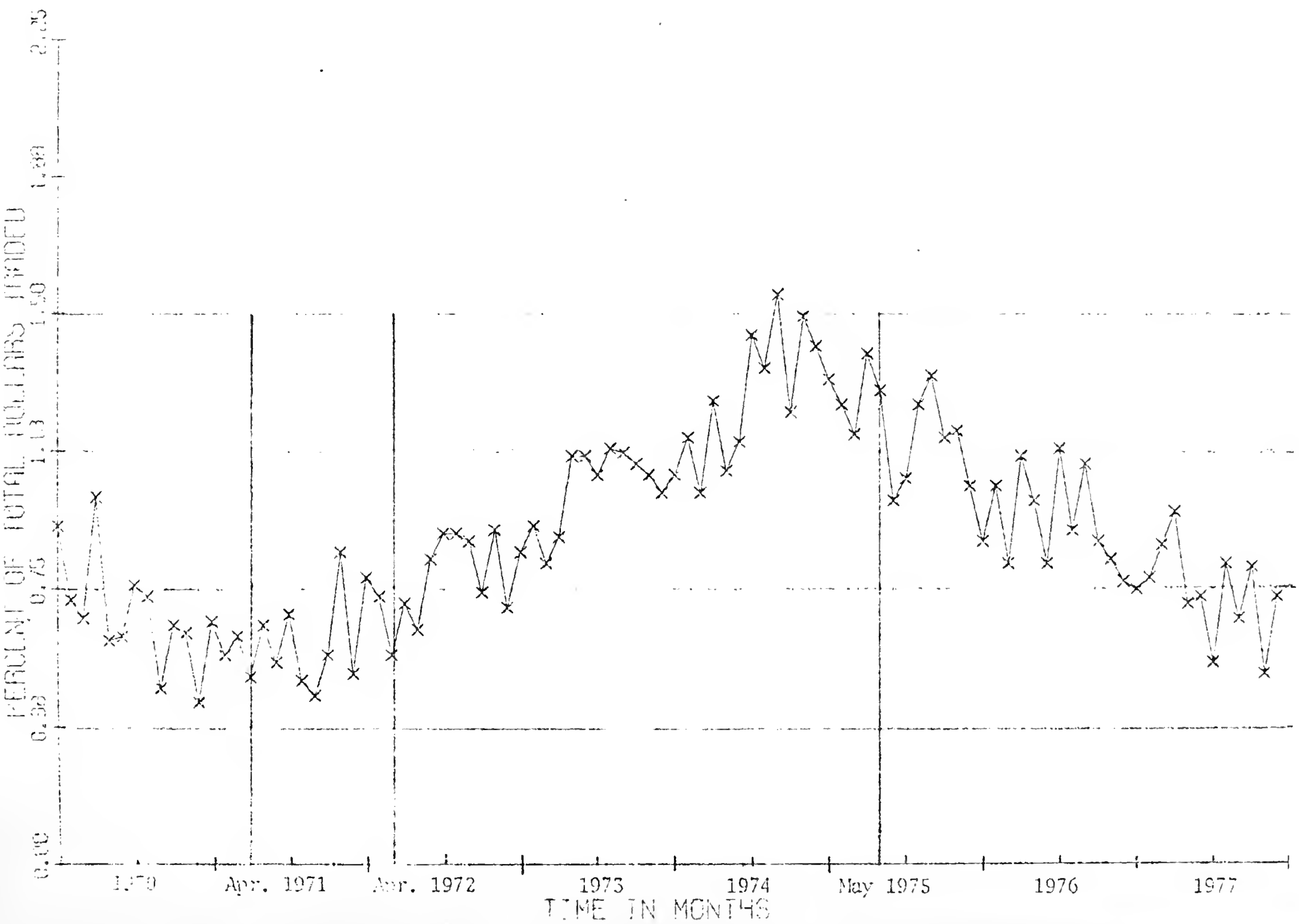


Figure 2

MONTHLY TIME SERIES PLOT OF DOLLAR VALUE OF TRADING ON BOSTON STOCK EXCHANGE
AS A PERCENTAGE OF TOTAL DOLLAR VALUE OF TRADING ON ALL REGISTERED EXCHANGES
January, 1970 - December, 1977



MONTHLY TIME SERIES PLOT OF DOLLAR VALUE OF TRADING ON CINCINNATI STOCK EXCHANGE
AS A PERCENTAGE OF TOTAL DOLLAR VALUE OF TRADING ON ALL REGISTERED EXCHANGES
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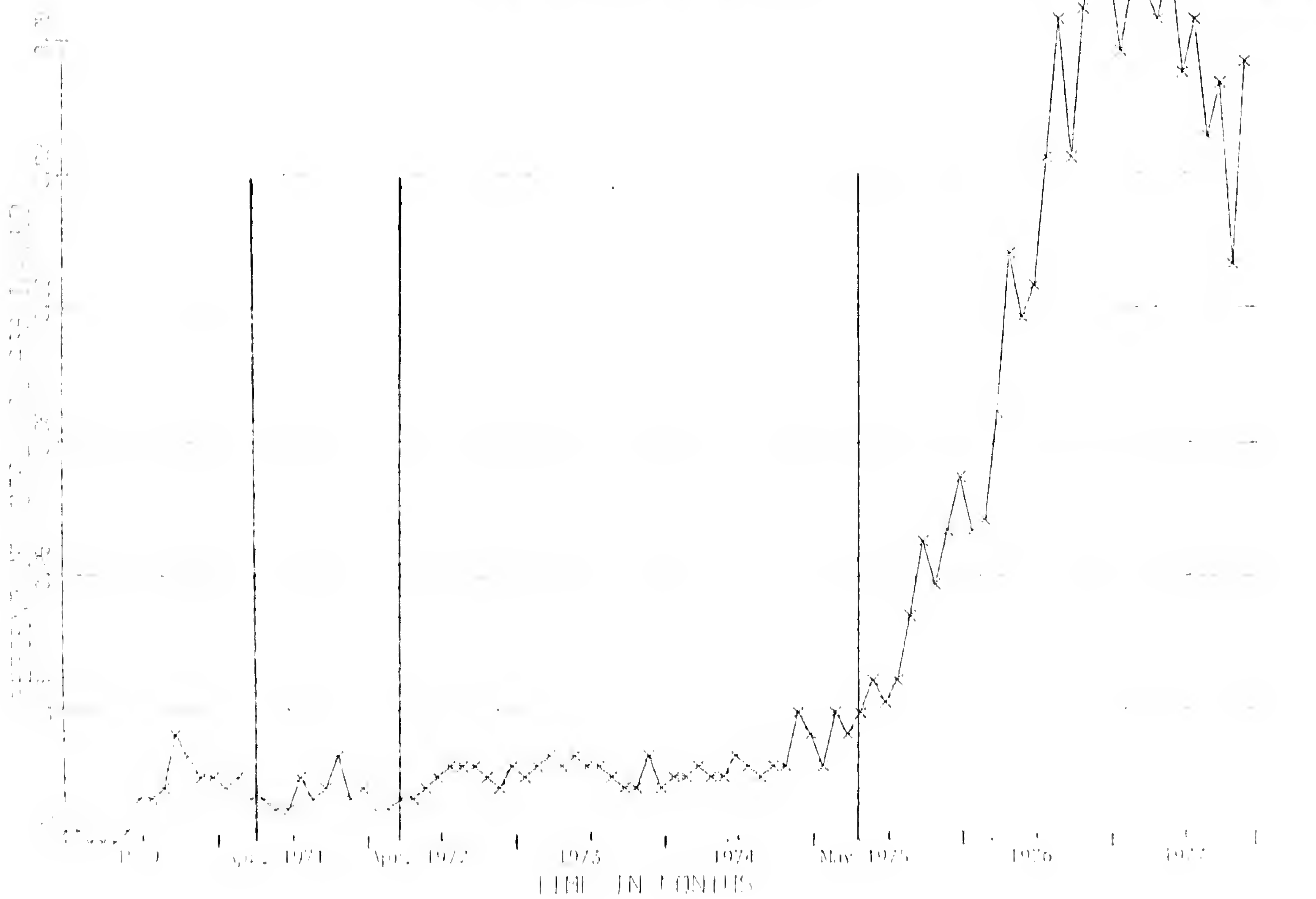
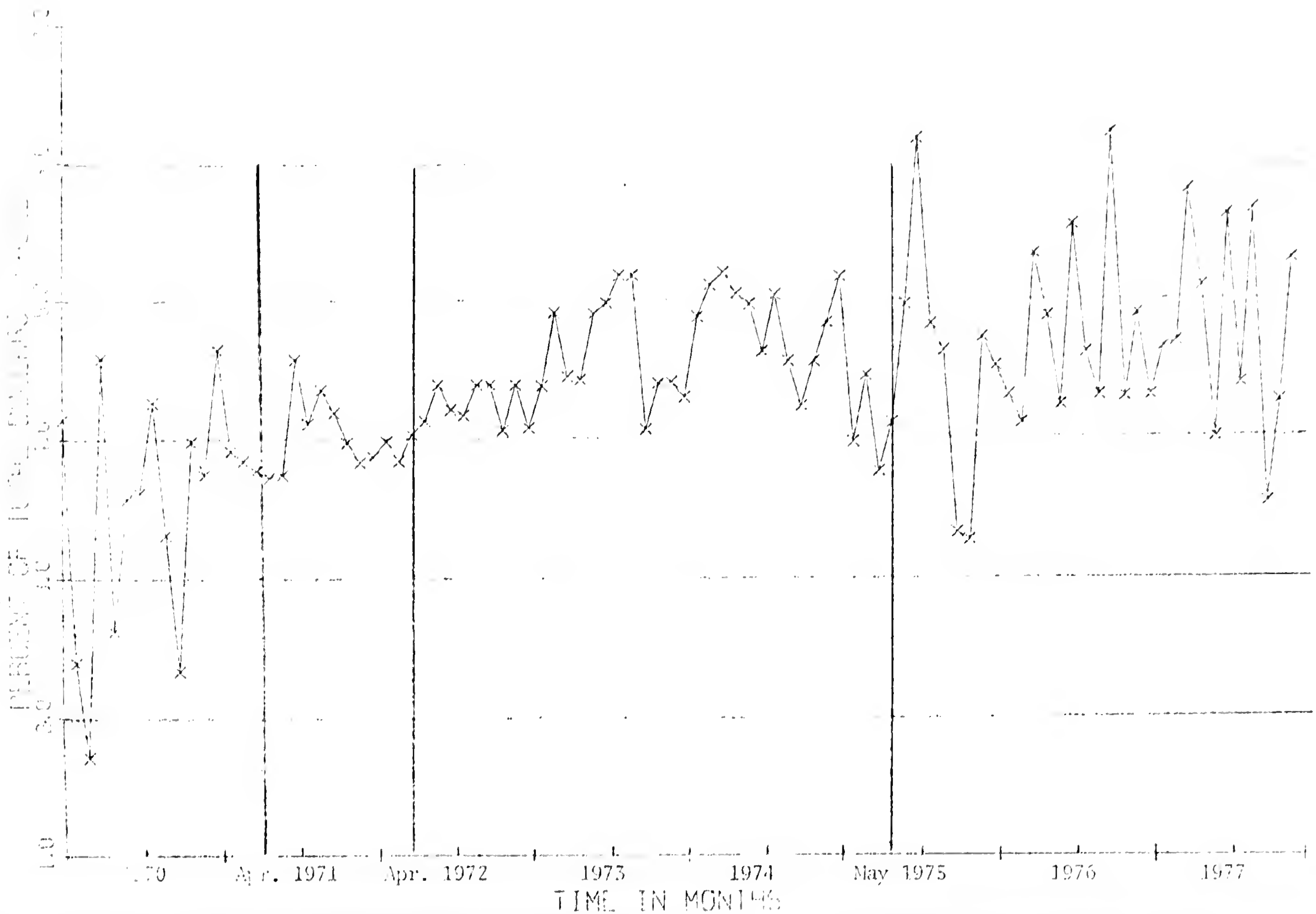


MONTHLY TIME SERIES PLOT OF DOLLAR VALUE OF TRADING ON MIDWEST STOCK EXCHANGE
AS A PERCENTAGE OF TOTAL DOLLAR VALUE OF TRADING ON ALL REGISTERED EXCHANGES
January, 1970 - December, 1977



MONTHLY TIME SERIES PLOT OF DOLLAR VALUE OF TRADING ON NEW YORK STOCK EXCHANGE
AS A PERCENTAGE OF TOTAL DOLLAR VALUE OF TRADING ON ALL REGISTERED EXCHANGES
January, 1970 - December, 1977

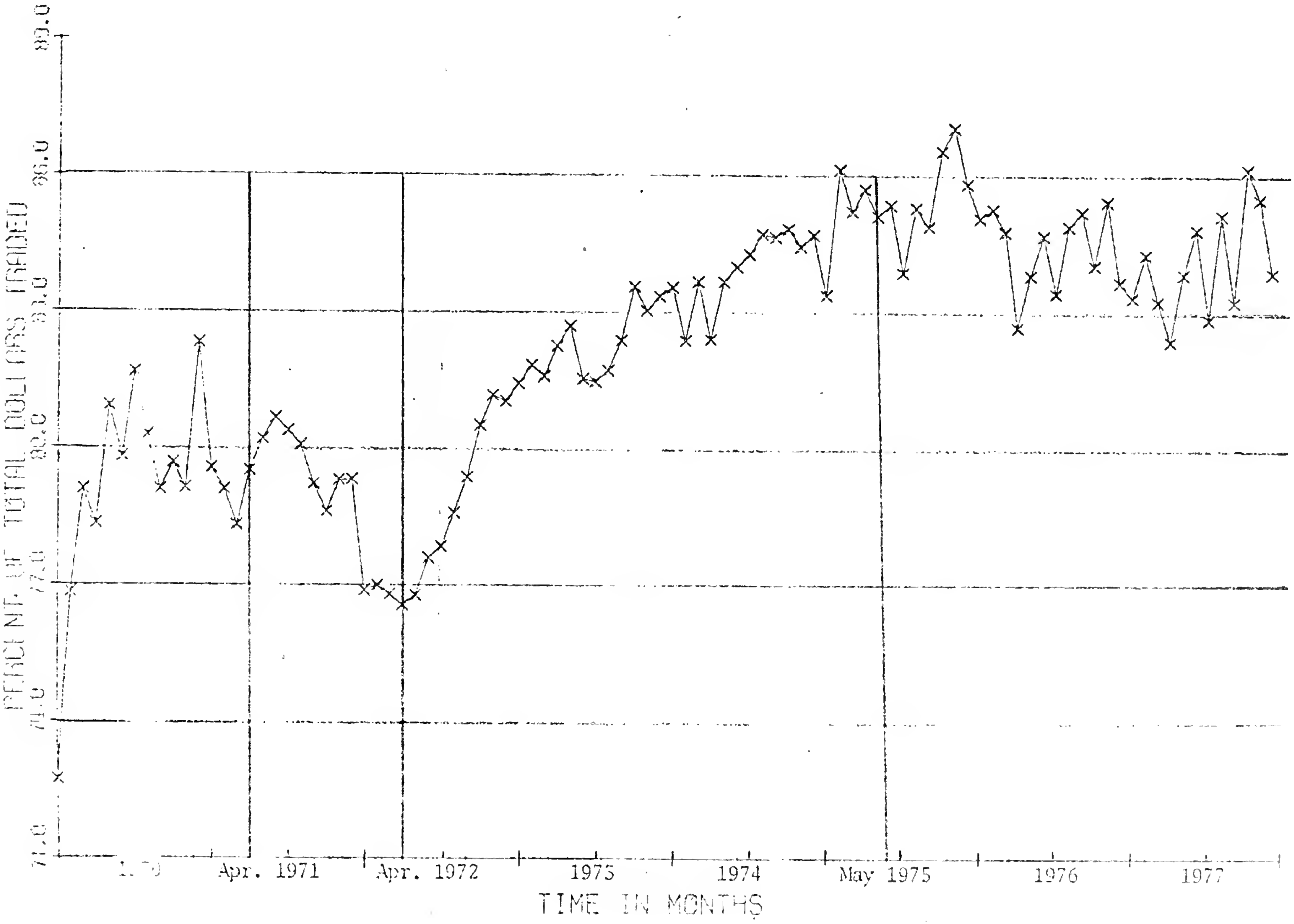
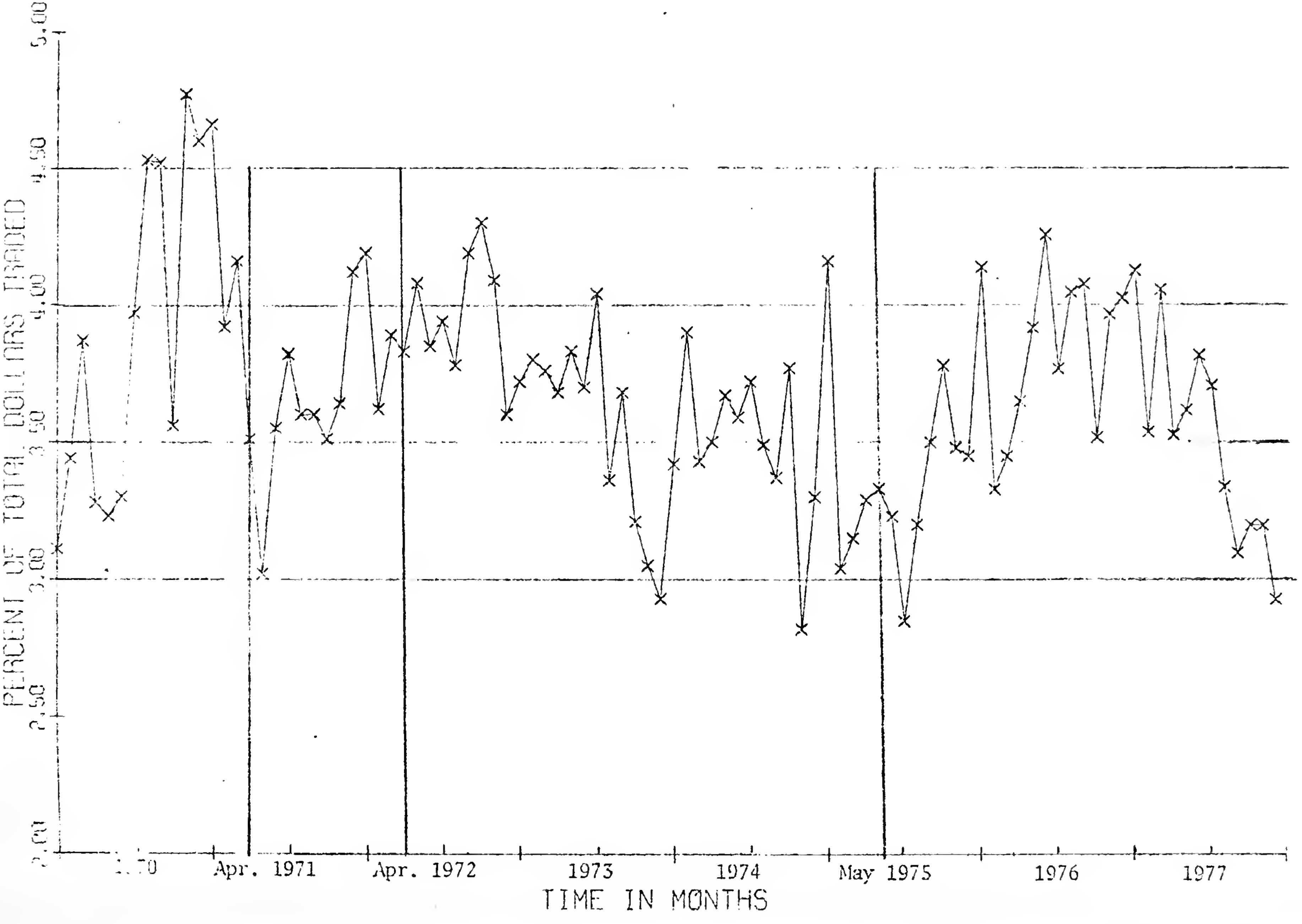
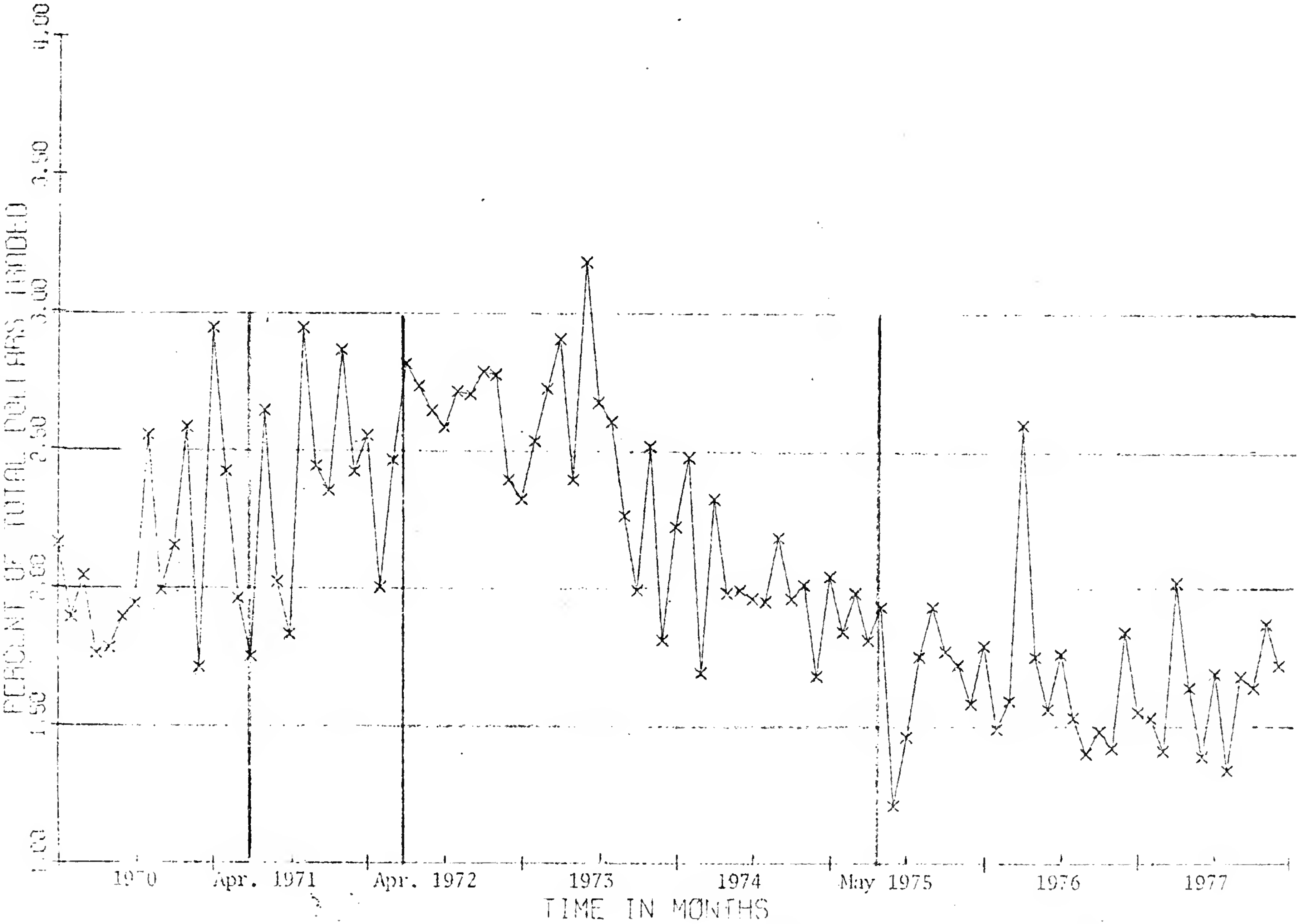


Figure 7

MONTHLY TIME SERIES PLOT OF DOLLAR VALUE OF TRADING ON PACIFIC STOCK EXCHANGE AS A PERCENTAGE OF TOTAL DOLLAR VALUE OF TRADING ON ALL REGISTERED EXCHANGES
January, 1970 - December, 1977



MONTHLY TIME SERIES PLOT OF DOLLAR VALUE OF TRADING ON PHILADELPHIA STOCK EXCHANGE
AS A PERCENTAGE OF TOTAL DOLLAR VALUE OF TRADING ON ALL REGISTERED EXCHANGES
January, 1970 - December, 1977



MONTHLY TIME SERIES PLOT OF DOLLAR VALUE
OF TRADING ON BOSTON, MIDWEST, PACIFIC, AND PHILADELPHIA STOCK EXCHANGES
AS A PERCENTAGE OF TOTAL DOLLAR VALUE OF TRADING ON ALL REGISTERED EXCHANGES
January, 1970 - December, 1977